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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/829,848	04/09/2001	Jonathan D. Reid	M-5593-2C US	9823

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EXAMINER

MUTSCHLER, BRIAN L

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 05/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/829,848

Applicant(s)

REID ET AL.

Examiner

Brian L. Mutschler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 17-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 17-24 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an electroplating apparatus and method of electroplating, does not reasonably provide enablement for any other types of plating processes, which are encompassed by the instant claims. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

In the instant disclosure, the only plating process disclosed is an electroplating process. The scope of the current claim language is inconsistent with the scope of the disclosure because the claims comprise language open to other forms of plating and other uses of the apparatus such as other wet-processes including electroless plating. In the specification, it is disclosed that electroplating apparatus has a "current source 192" to pass a current through the solution and wafer (see page 6, lines 5-9 and Figure 1). Claim 17, which recites, "An electroplating process unit", does not recite any limitations particular to an electroplating apparatus. While a plating bath container is used in electroplating apparatuses, it is also a feature of electroless plating apparatuses. Additionally, claims 19 and 21 recite the limitation, "immersing said wafer in said plating solution", but do not recite any plating steps, electroplating or otherwise. It is suggested that the claims be amended to recite structural features, such as

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anodes/cathodes or a power source, which help define an electroplating apparatus, and also include some form of plating steps in the method claims.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 17-20 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The preamble of the claim recites “an electroplating process unit” but the body of the claim does not recite any structural elements that make the apparatus an electrolytic apparatus.

5. Claims 21-24 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The preamble of claim 21 recites “a method of electroplating a semiconductor wafer” but the body of the claim does not recite a plating step, or more importantly, an electroplating step.

Allowable Subject Matter

6. Claims 17-24 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, first paragraph and second paragraph, set forth in this Office action.

The instant invention is distinguished over the prior art of record because it provides an apparatus and method capable of electroplating, pre-treating and rinsing in

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the same chamber using different fluid outlets to remove the used solutions without diluting or otherwise contaminating the plating solution. In the prior art devices, such as the apparatuses disclosed by Volodarsky et al. (U.S. Pat. No. 6,352,623), Schuster et al. (U.S. Pat. No. 5,000,827) and Ting et al. (U.S. Pat. No. 6,077,412), a single solution outlet is provided to either recycle or remove the excess fluids. In the device of Ting et al., the solution outlet is also located below the plating solution container (see Figures 5 and 6). Schuster et al. disclose a reclaim inlet around the plating solution container, but do not disclose an additional removal inlet above the reclaim inlet (see Figure 7).

Volodarsky et al. disclose a device wherein the wafer is positioned on an actuator that can spin the wafer and move the wafer vertically (see Figures 1, 2 and 4-6). The wafer is raised on the actuator to a position located above the electrolytic chamber portion, where the wafer is rinsed with a solution that is removed from the rinsing portion (see Figures 2 and 6). However, Volodarsky et al. do not disclose the use of a second solution inlet located above the electrolytic chamber, as claimed in the instant invention.

Adams et al. disclose a drainage system that has two separate drainage inlets, but the system does not combine the drainage portion with an electrolytic plating portion.

The instant invention provides the advantage of being able to pre-treat and/or rinse a wafer in the same device where the electroplating takes place, as well as means to remove excess rinse solution without diluting or contaminating the plating solution, or without requiring the removal and replacement of the entire plating solution after each electroplating step.


Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Pat. No. 6,352,623 issued to Volodarsky et al. and U.S. Pat. No. 6,214,193 issued to Reid et al. (parent of the instant application) are considered relevant to the instant claims, although they are not available under 35 U.S.C. 102 or 35 U.S.C. 103.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (703) 305-0180. The examiner can normally be reached on Monday-Friday from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

blm
April 25, 2003